CLAIMS:

1. An air-fuel ratio control apparatus for an internal combustion engine, the apparatus implementing integral correction of the air-fuel ratio with an integral term, the integral term being obtained by multiplying an integrated difference between a target air-fuel ratio and the actual air-fuel ratio by an integral gain, the apparatus being characterized in that an upper limit value and a lower limit value of the integral term are set based on an actual intake air amount and an actual air-fuel ratio.

2. The air-fuel ratio control apparatus for an internal combustion engine according to Claim 1, wherein the upper and lower limit values are set in such a way to reduce the interval between the limit values as the actual intake air amount decreases.

3. The air-fuel ratio control apparatus for an internal combustion engine according to Claim 1, wherein the upper and lower limit values are set in such a way to reduce the absolute value of each limit value as the actual intake air amount decreases.

4. The air-fuel ratio control apparatus for an internal combustion engine according to any one of Claims 1 to 3, wherein the upper and lower limit values are set in such a way that air-fuel ratio correction with the integral term to the lean side is limited as the actual air-fuel ratio becomes leaner.

5. The air-fuel ratio control apparatus for an internal combustion engine according to any one of Claims 1 to 4, wherein the upper and lower limit values are set in such a way

to allow larger correction of the air-fuel ratio with the integral term to the lean side as the actual air-fuel ratio remains leaner than the target ratio for a longer period.

6. The air-fuel ratio control apparatus for an internal combustion engine according to any one of Claims 1 to 4, wherein the upper and lower limit values are set in such a way to allow larger correction of air-fuel ratio with the integral term to the rich side as the actual air-fuel ratio remains richer than the target ratio for a longer period.

7. The air-fuel ratio control apparatus for an internal combustion engine according to any one of Claims 1 to 6, wherein air-fuel ratio learning control is implemented, in which a steady state deviation between the actual air-fuel ratio and the target air-fuel ratio is computed based on a history of difference between the air-fuel ratios, and the computed steady state deviation is stored as a learning value, and wherein, until the computation of the steady state deviation is completed, the upper and lower limit values are set in such a way to have a smaller interval between the limit values than that after the computation of the steady state deviation is completed.

8. The air-fuel ratio control apparatus for an internal combustion engine according to any one of Claims 1 to 6, wherein air-fuel ratio learning control is implemented, in which a steady state deviation between the actual air-fuel ratio and the target air-fuel ratio is computed based on a history of difference between the air-fuel ratios, and the computed steady state deviation is stored as a learning value, and wherein, until the computation of the steady state deviation is completed, the upper and lower limits are set in such a way to each have a smaller absolute value than that

after the computation of the steady state deviation is completed.